UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Yuqi Chen et al.
Invention:	METHOD FOR DESIGNING A BLOWER WHEEL SCROLL CAGE
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Examiner:	Jason Proctor

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Commissioner for Patents
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COMMENTS ON STATEMENT OF REASONS FOR ALLOWANCE

In response to the Notice of Allowance, dated December 5, 2006, applicants respectfully submit the following comments on statement of reasons for allowance. Applicants submit that the prior art of record fails to teach or suggest the invention of claims 1, 5, 9 and 16.

Specifically, claim 1 recites a method for determining the shape of a scroll cage for a forward-curved centrifugal blower wheel in a blower housing having a blower cut-off end comprising: determine the blower wheel dimensions (R_{wheel} x blower wheel depth); calculate ρ_o, the radius of a blower circle, comprising the distance from the center of the blower wheel to the blower cut-off end, using the formula: $\rho_o = R_{wheel} + \delta$, where δ, the radial wheel clearance, is selected from the range of: $10\text{mm} \leq \delta \leq 20\text{mm}$; determine ρ_e, the distance from the center of the blower wheel to a discharge point of the scroll cage at the tangential point of the scroll cage and the blower housing, and calculate b, the difference between ρ_e and ρ_o using the formula: $b = \rho_e - \rho_o$; select a diffusing angle α, the angle between the blower circle and

the blower cut-off at the blower cut-off end, from the range of: $8^o < \alpha < 13^o$; calculate a development angle φ_o, the polar angle between the radial line from the center of the blower wheel to the blower cut-off end and the radial line from the center of the blower wheel to the discharge point, using the formula: $\varphi_o \tan \alpha = (180/\pi)\ (b/\rho_o)$; and plot the scroll cage profile on polar coordinates starting at the cut-off end using the formula: $\rho = \rho_o + \varphi\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$) where ρ is the distance from the center of the blower wheel to the scroll cage and ending at the discharge point at (φ_o , ρ_e).

Claim 5 recites a method for determining the shape of a scroll cage for a forward-curved centrifugal blower wheel in a blower housing having a blower cut-off end comprising: determine the blower wheel dimensions (R_{wheel} x blower wheel depth); calculate ρ_o, the radius of a blower circle, comprising the distance from the center of the blower wheel to the blower cut-off end, using the formula: $\rho_o = R_{wheel} + \delta$, where δ, the radial wheel clearance, is selected from the range of: $10\text{mm} \leq \delta \leq 20\text{mm}$; determine ρ_e, the distance from the center of the blower wheel to the discharge point of the scroll cage at the tangential point of the scroll cage and the blower housing, and calculate b, the difference between ρ_e and ρ_o using the formula: $b = \rho_e - \rho_o$; select a diffusing angle α, the angle between the blower circle and the blower cut-off at the blower cut-off end, from the range of: $8^o < \alpha < 13^o$; calculate a development angle φ_o, the polar angle between the radial line from the center of the blower wheel to the blower cut-off end and the radial line from the center of the blower wheel to the discharge point, using the formula: $\varphi_o \tan \alpha = (180/\pi)\ (b/\rho_o)$; and plot the scroll cage profile on polar coordinates starting at the discharge point using the formula: $\rho = \rho_o + (\varphi_o - \varphi)\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$) where ρ is the distance from the center of the blower wheel to the scroll cage and ending at the blower cut-off end at (φ_o , ρ_o).

Claim 9 recites a method for determining the shape of a scroll cage of a blower housing having a blower cut-off end for a forward-curved centrifugal blower wheel for use in a room air conditioner comprising: determine the air flow requirements (*CFM*) for the room air conditioner; determine the blower wheel dimensions (R_{wheel} x blower wheel depth), blower wheel shaft location and blower housing dimensions based on the room air conditioner performance objectives and cabinet dimensions; calculate ρ_o, the radius of a blower circle, comprising the distance from the center of the blower wheel to the blower cut-off end, using the formula: $\rho_o = R_{wheel} + \delta$, where δ, the radial wheel clearance, is selected from the range of: $10\text{mm} \leq \delta \leq 20\text{mm}$; determine ρ_e, the distance from the center of the blower wheel to the

discharge point of the scroll cage at the tangential point of the scroll cage and the blower housing, and calculate b, the difference between ρ_e and ρ_o using the formula: $b = \rho_e - \rho_o$; select a diffusing angle α, the angle between the blower circle and the blower cut-off at the blower cut-off end, from the range of: $8^o < \alpha < 13^o$; calculate a development angle φ_o, the polar angle between the radial line from the center of the blower wheel to the blower cut-off end and the radial line from the center of the blower wheel to the discharge point, using the formula: $\varphi_o \tan \alpha = (180/\pi)\ (b/\rho_o)$; and plot the scroll cage profile on polar coordinates starting at the cut-off end using the formula: $\rho = \rho_o + \varphi\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$) where ρ is the distance from the center of the blower wheel to the scroll cage and ending at the discharge point at (φ_o , ρ_e).

Claim 16 recites a method for determining the shape of a scroll cage of a blower housing having a blower cut-off end for a forward-curved centrifugal blower wheel for use in a room air conditioner comprising: determine the air flow requirements (*CFM*) for the room air conditioner; determine the blower wheel dimensions (R_{wheel} x blower wheel depth), blower wheel shaft location and blower housing dimensions based on the room air conditioner performance objectives and cabinet dimensions; calculate ρ_o, the radius of a blower circle, comprising the distance from the center of the blower wheel to the blower cut-off end, using the formula: $\rho_o = R_{wheel} + \delta$, where δ, the radial wheel clearance, is selected from the range of: $10\text{mm} \leq \delta \leq 20\text{mm}$; determine ρ_e, the distance from the center of blower wheel to the discharge point of the scroll cage at the tangential point of the scroll cage and the blower housing, and calculate b, the difference between ρ_e and ρ_o using the formula: $b = \rho_e - \rho_o$; select a diffusing angle α, the angle between the blower circle and the blower cut-off at the blower cut-off end, from the range: $8^o < \alpha < 13^o$; calculate a development angle φ_o, the polar angle between the radial line from the center of the blower wheel to the blower cut-off end and the radial line from the center of the blower wheel to the discharge point, using the formula: $\varphi_o \tan \alpha = (180/\pi)\ (b/\rho_o)$; and plot the scroll cage profile on polar coordinates starting at the discharge point using the formula: $\rho = \rho_o + (\varphi_o - \varphi)\ b/\varphi_o$ (for $0 \leq \varphi \leq \varphi_o$) where ρ is the distance from the center of the blower wheel to the scroll cage and ending at the blower cut-off end at (φ_o , ρ_o).

With respect to the Examiner's comments regarding claim interpretation, Applicants respectfully submit that additional parameters may determine what is meant by best of

optimum blower performance. A consideration of generated static pressure may also be considered as specifically indicated in the specification at paragraph [0015].

Respectfully submitted,

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